

Appl. No. : 10/558,843  
Filed : November 29, 2005

## AMENDMENTS TO THE CLAIMS

**Please cancel Claims 1-6, without prejudice.**

**Please amend Claims 7 and 9-13, and add Claims 14 and 15 as follows.**

1-6. (Cancelled)

7. (Currently amended) A method for preparing a ~~synthesis~~synthetic gas from methane and an oxygen containing compound using an atmospheric pressure barrier discharge reaction, the method comprising:

~~a first step of filling a catalyst in a reactor consisting of~~having a quartz tube 5 constituting a body of the reactor and serving as a dielectric at the same time, and heating the methane reforming catalyst layer 8 ~~with a heating member 9;~~

~~a second step of mixing the methane and the oxygen containing compound when a temperature is maintained to be 200~400 °C through the first step~~filling and then introducing the mixture into the reactor via an inlet tube 1;

~~a third step of applying, simultaneously with the mixing, a high voltage to an internal electrode 3 of the reactor and an external electrode 4 consisting of~~having a metal thin film ~~of the reactor using a power supply 6 simultaneously with the second step to generate plasma in the reactor consisting of the quartz tube 5, thereby preparing~~producing a ~~synthesis~~synthetic gas; and

~~a fourth step of discharging the ~~synthesis~~synthetic gas obtained in the third step to an exterior via an outlet 2 of the reactor.~~

8. (Original) The method according to claim 7, wherein the oxygen containing compound is one selected from a group consisting of carbon dioxide, water and air.

9. (Currently amended) The method according to claim 7, wherein the catalyst ~~in the first step~~ is a methane reforming catalyst and is one selected from a group consisting of nickel catalyst, noble metal catalyst, alkali metal catalyst and alkali earth metal catalyst.

Appl. No. : 10/558,843  
Filed : November 29, 2005

10. (Currently amended) The method according to claim 7-~~or~~ 9, wherein the catalyst is nickel catalyst.

11. (Currently amended) The method according to claim 7, wherein a temperature of the heating member 9-is maintained to be 200~400 °C.

12. (Currently amended) The method according to claim 7, wherein the methane and the oxygen containing compound introduced in the ~~second step~~mixing react while passing through a region 7a-in which the plasma only exists among an area 7-in which the plasma is generated in the reactor in the ~~third step~~applying, and complete the reaction while passing through a successive region 7b-in which the plasma and the catalyst are mixed.

13. (Currently amended) The method according to claim 7, wherein the external electrode 4 is made of a metal coated to be thin on the quartz tube 5-with a thickness of 0.5 mm or less.

14. (New) The method according to claim 7, wherein the method is carried out by using an apparatus for preparing a synthetic gas from methane and an oxygen containing compound using an atmospheric pressure barrier discharge reaction, the apparatus comprising:

an inlet tube mixing and introducing the methane and the oxygen containing compound into a reactor;

an internal electrode of the reactor;

an external electrode made of a metal thin film of the reactor;

a quartz tube constituting a body of the reactor and serving as a dielectric;

a methane reforming catalyst layer filled in the atmospheric pressure barrier discharge reactor having the quartz tube so as to induce a catalyst reaction;

a heating member mounted to heat the catalyst layer only;

a power supply supplying currents to the internal and external electrodes to generate plasma;

electric wires in which currents flow;

a current-grounded part; and

Appl. No. : 10/558,843  
Filed : November 29, 2005

an outlet for discharging a product (synthetic gas) prepared as a reaction is completed into an exterior.

15. (New) The method according to claim 9, wherein the catalyst is nickel catalyst.